

Science in a Bag – Teacher Page
Sink or Float Activity



Grade Level: 3rd Grade

Standards

GLE 0307.9.1 Design a simple experiment to determine how the physical properties of matter can change over time and under different conditions.

90307.9.1 Use physical properties to compare and contrast substances.

SPI 0307.9.1 Describe a substance in terms of its physical properties.

Task Objective

- TLW make and test predictions about sinking and floating.
- TLW classify objects according to whether they sink or float.

Explanation

This learning activity is designed to introduce the students to the concept of sinking and floating. Objects do not sink because of their size; they sink because they are less dense than the liquid they are placed in. If an object has more density than the liquid, it will float, and the object is said to be buoyant. Some objects have buoyancy and some do not. Objects that are buoyant will float, and objects that are not buoyant will sink. The handouts will give students an understanding of when an object is put into water, it pushes a certain amount of water away and displaces it (sinks). If the weight of the displaced water is heavier than the object placed in the water, then the object will float. If the object that is being tested, is heavier than the weight of the displaced water, it would sink. Also, if an object has air in it, it will most likely float, but if the object has no air in it, the object will sink. This is why boats as big as they are can float and pennies as small as they are will sink. Water is relatively dense, a high-volume, low-density object is likely to displace a quantity of water more dense, and heavier, than the object itself. By contrast, a steel ball dropped into the water will sink straight to the bottom, because it is a low-volume, high-density object that outweighs the water it displaced.

Academic Vocabulary

Density - the measure of the amount of matter in a certain object.

Buoyancy - how well something floats.

Sink - to go below the surface of the water.

Float - to stay above the surface of the water.

Analyzing - considering information gathered during an experiment.

Observing - using our senses to gather information.

I chose the Frayer Model because it will allow students to develop their vocabulary as well as organize their understanding of the sink or float concept. It will provide the students with the opportunity to clarify what they think the concept is and communicate their understanding by providing a definition, illustration, examples, and non-examples from their own experiences or background knowledge of the concept.

Common Misconceptions

- Water is pushing up on the object
- Weight determines if an object will sink or float.
- Heavy objects always sink and light objects always float.
- The amount of water will cause objects to float or sink better.
- A larger heavier object will not float as well as a smaller lighter object of the same material.

Real World Connection

Buoyancy is what gives fish, human swimmers, icebergs, and ships the ability to stay afloat. Fish offer an application of volume change as a means of altering buoyancy: a fish has an internal swim bladder, which is filled with gas. When it needs to rise or descend, it changes the volume in its swim bladder, which then changes its density.

Connections Across the Curriculum

1. This activity could be used in Mathematics while the students are using the graphic organizer to collect the data. Students could make graphs to show the number of items that float and the items that sink. **Common Core 3.MD.3** Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.
2. This activity could be used in History class to show students that people in history have studied and used this process to invent boats, ships, submarines, etc. **Social Studies 3.16** Use timelines and historical passages to summarize the history of a region, including events, inventions/inventors, artists, writers, and political figures. (C, G, H, P, TN) Suggestions are as follows: Christopher Columbus, Benjamin Franklin, George Washington, Daniel Boone, Nancy Ward, Thomas Jefferson, Betsy Ross, Noah Webster, Abraham Lincoln, Susan B. Anthony, Harriett Tubman, Geronimo, George

Washington Carver, Georgia O'Keefe, Amelia Earhart, E.B. White, Rosa Parks, Martin Luther King Jr., Dian Fossey, and Barack Obama.

3. This activity could be used in writing to explain what happened to certain objects when they were dropped into the water and why it happened. **Common Core 3.W.2** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

References

Standards:

<https://www.tn.gov/education/article/science-standards>

Academic Vocabulary:

http://www.sesamestreet.org/cms_services/services?action=download&uid=52c5bd0a-c35c-4fdb-88c3-4565c8ff7f30

Lesson Plan:

<http://sciencenetlinks.com/lessons/sink-or-float/>

Real Life Connections:

<http://www.scienceclarified.com/everyday/Real-Life-Chemistry-Vol-3-Physics-Vol-1/Buoyancy-Real-life-applications.html#ixzz3yybNcArW>

<http://www.scienceclarified.com/everyday/Real-Life-Chemistry-Vol-3-Physics-Vol-1/Buoyancy-Real-life-applications.html#ixzz3z7mM4Z7i>

Common Misconceptions:

<http://www.education.vic.gov.au/school/teachers/teachingresources/discipline/science/continuum/Pages/floatsink.aspx>

Science in a Bag – Student Page
Sink or Float Activity



Grade Level: 3rd Grade

Standards

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Task Objective

- TLW make and test predictions about sinking and floating.
- TLW classify objects according to whether they sink or float.

Materials Needed

- Water
- Big clear bin (that can hold water)
- Water bottles (for each table)
- Varying objects to measure sinking or floating—I'm using; pen, pencil , scissors, crayon, hair tie, paperclip, glue, hairclip, chapstick, penny, quarter, q-tip, rock, key, index card, comb, eraser, plastic fork
- Float or sink prediction worksheets
- Float or sink results worksheets

Procedures

1. Look at the “Does it Sink or Float” prediction worksheet. You will be using this worksheet during and after the experiment.
2. Take the smaller plastic bin out of the science box and fill it with water from the pink water bottle.
3. Choose at least 3 objects from the science box.
4. Think about whether or not the objects you chose will sink or float when placed into the water.
5. After you come up with your predictions, refer back to the “Does it Sink or Float” worksheet.
 - a. draw a picture of each object in the “prediction” boxes on the worksheet. If you predict that the item will float, draw a picture of the item above the line in the box. If you predict that the item will

- sink, draw a picture of the item below the line (in the shaded region of the prediction box).
- b. When you complete your predictions, put this worksheet to the side because you will need to answer the remaining questions at the end of the experiment.
6. Place an object into the water and observe what happens.
 7. Repeat this for all of the objects.
 8. When you are finished with the experiment, complete the remaining questions on the "Does it Sink or Float" worksheet.
 - a. In the "actual" boxes, draw a picture of what actually happened to the object when it was placed in the water. If it floats, draw a picture of the object above the line in the box. If it sinks, draw a picture of the object below the line (in the shaded region of the box).
 - b. Then, answer the question, "Was your prediction right?" Circle yes, if your prediction was correct and circle no, if your prediction was not correct.
 9. Record the answers for the following questions in your interactive notebook: *Why do you think some objects floated and some sank? Is there anything the same about the objects that floated? How about with the objects that sank?*

Academic Vocabulary

Complete the Frayer Model using one of these vocabulary words: "sink" or "float."

- (1) define the chosen vocabulary word for this activity,
- (2) draw a picture to illustrate the meaning of the word,
- (3) apply this information by generating examples and non-examples of the vocabulary word.

This information should be placed on the provided chart handout that is divided into four sections and then turned in to me.

Assessment

Three-Two-One #64

1. Respond in writing to the three reflective prompts.
2. Write three things you understand from the lesson,
3. two things you are still wondering about,
4. and one thing that will help you learn tomorrow.
5. Turn into the "Science" tray when finished.

Clean-up

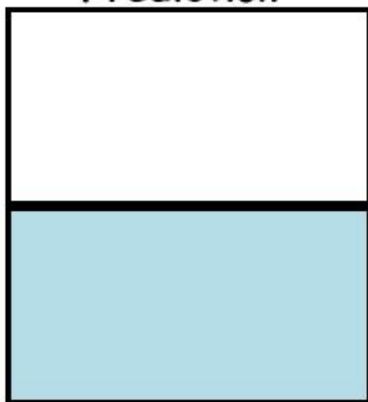
Once you have finished the activity, pour the water out of the bin, dry the contents, and replace them back into the science box. Turn your worksheet "Does it Sink or Float?" and the "Three-Two-One" assessment into the "Science" tray on my desk. Place the science box back onto the science activity table.

Name _____

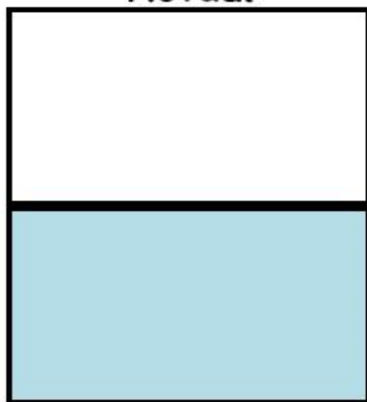
Does It Sink or Float?

Directions: Choose three items to experiment with. Think about whether the object will sink or float and draw your prediction in the first box. After experimenting to see whether the object sinks or floats, draw the actual answer in. Then, circle if your prediction was right.

Prediction



Actual

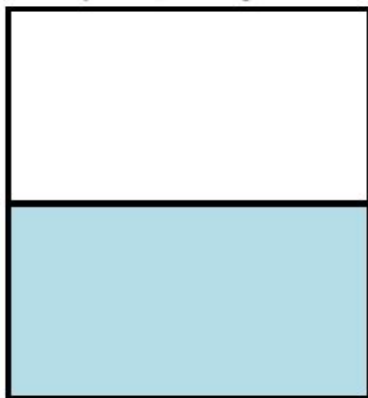


Was your prediction right?

Yes

No

Prediction



Actual

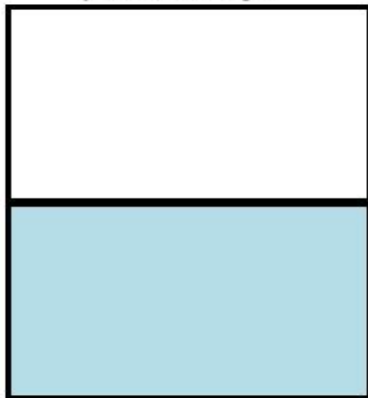


Was your prediction right?

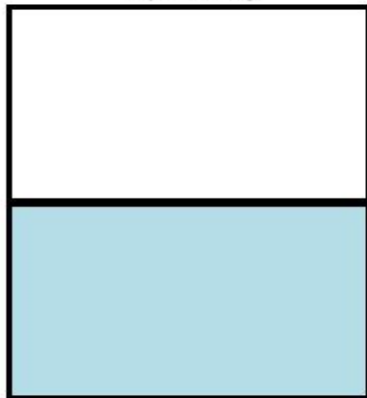
Yes

No

Prediction



Actual



Was your prediction right?

Yes

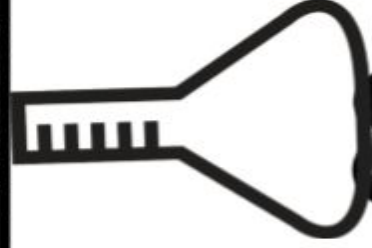
No

Definition

Illustration

Examples

Non-Examples



3-2-1 Reflection

3 things I understand:

1.

2.

3.

2 things I am still wondering about:

1.

2.

1 thing that will help me learn tomorrow:

1.